National Health and Nutrition Examination Survey 2005–2006

Documentation, Codebook, and Frequencies

Iron, Total Iron Binding Capacity (TIBC), and Transferrin Saturation

Laboratory

Survey Years:
2005 to 2006

SAS Transport File:
FETIB_D.XPT

December 2007

NHANES 2005–2006 Data Documentation

Laboratory Assessment: Iron, Total Iron Binding Capacity (TIBC), and Transferrin Saturation (FETIB_D)

First Published: December 2007 **Last Revised:** N/A

Component Description

The specific objective of this component is to determine the prevalence of iron deficiency anemia using iron and TIBC (transferrin saturation) in conjunction with ferritin and erythrocyte protoporphyrin. The general objectives of the nutritional biochemistry components are: 1) to provide data for monitoring secular trends in measures of nutritional status in the U.S. population; 2) to evaluate the effect of people's habits and behaviors such as physical activity and the use of alcohol, tobacco, and dietary supplements on people's nutritional status; and 3) to evaluate the effect of changes in nutrition and public health policies, including welfare reform legislation, food fortification policy, and child nutrition programs on the nutritional status of the U.S. population. These data will be used to estimate deficiencies and toxicities of specific nutrients in the population and subgroups, to provide population reference data, and to estimate the contribution of diet, supplements, and other factors to serum levels of nutrients. Data will be used for research to further define nutrient requirements as well as optimal levels for disease prevention and health promotion.

Eligible Sample

Participants aged 3–5 years and females aged 12–59 years who do not meet any of the exclusion criteria are eligible.

Description of Laboratory Methodology

Iron

The method used to measure the iron concentration was a timed-endpoint method. In the reaction, iron was released from transferrin by acetic acid and reduced to the ferrous state by hydroxylamine and thioglycolate. The ferrous ion was complexed with the FerroZine Iron reagent. The system monitored the change in absorbance at 560 nm at a fixed time interval. This change in absorbance was directly proportional to the concentration of iron in the sample. The iron was measured on the Beckman/Coulter LX20 analyzer.

TIBC

TIBC was calculated indirectly using the unsaturated iron binding capacity (UIBC) method.

A known ferrous iron standard of 105 µmol/L (586 µg/dL) was incubated with serum at a pH of 7.9, which saturates the available binding sites on serum transferrin. The unbound excess iron was then complexed with

ferene to form ferrous ferene, a blue complex, which was measured by the Beckman/Coulter LX 20 analyzer. The UIBC was equal to the total iron added minus the excess iron. The TIBC is the sum of iron and UIBC.

Transferrin saturation

The transferrin saturation value was calculated as (iron/TIBC) × 100%. The iron variable name is LBXIRN, the TIBC variable name is LBXTIB, and the variable name for transferrin saturation is LBDPCT.

There was no change to the equipment, method or laboratory.

A detailed description of the laboratory method used can be found on the NHANES website.

Laboratory Quality Control and Monitoring

The NHANES quality control and quality assurance protocols (QA/QC) meet the 1988 Clinical Laboratory Improvement Act mandates. Detailed quality control and quality assurance instructions are discussed in the NHANES Laboratory/Medical Technologists Procedures Manual (LPM). Read the LABDOC file for detailed QA/QC protocols.

A detailed description of the quality assurance and quality control procedures can be found on the NHANES website.

Data Processing and Editing

Specimens were processed, stored, and shipped to Collaborative Laboratory Services in Ottumwa, Iowa. Detailed specimen collection and processing instructions are discussed in the NHANES LPM. Read the LABDOC file for detailed data processing and editing protocols. The analytical methods are described in detail in the Description of the Laboratory Methodology section.

Detailed instructions on specimen collection and processing can be found on the NHANES website.

Analytic Notes

The analysis of NHANES 2005–2006 laboratory data must be conducted with the key survey design and basic demographic variables. The NHANES 2005–2006 Household Questionnaire Data files contain demographic data, health indicators, and other related information collected during household interviews. They also contain all survey design variables and sample weights for these age groups. The phlebotomy file includes auxiliary information such as the conditions precluding venipuncture. The household questionnaire and phlebotomy files may be linked to the laboratory data file using the unique survey participant identifier SEQN.

References

N/A

Locator Fields

Title: Iron, Total Iron Binding Capacity (TIBC), and Transferrin Saturation

Contact Number: 1-866-441-NCHS

Years of Content: 2005–2006

First Published: December 2007

Last Revised: N/A

Access Constraints: None

Use Constraints: None

Geographic Coverage: National

Subject: Iron, Total Iron Binding Capacity (TIBC), and Transferrin Saturation

Record Source: NHANES 2005–2006

Survey Methodology: NHANES 2005–2006 is a stratified multistage probability sample of the civilian non-institutionalized population of the U.S.

Medium: NHANES Web site; SAS transport files

National Health and Nutrition Examination Survey
Codebook for Data Production (2005-2006)

Iron, Total Iron Binding Capacity (TIBC), and Transferrin Saturation (FETIB_D)

Person Level Data

December 2007

SEQN	Target
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 59 Yrs.)
Hard Edits	**SAS Label**
	Respondent sequence number
English Text: Respondent sequence number.	
English Instructions:	

LBXIRN	Target
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 59 Yrs.)
Hard Edits	**SAS Label**
	Iron, Frozen Serum (ug/dL)
English Text: Iron, Frozen Serum (ug/dL)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
7 to 380	Range of Values	3096	3096	
.	Missing	442	3538	

LBDIRNSI	Target
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 59 Yrs.)
Hard Edits	**SAS Label**
	Iron, Frozen Serum (umol/L)
English Text: Iron, Frozen Serum (umol/L)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
1.25 to 68.02	Range of Values	3096	3096	
.	Missing	442	3538	

LBXTIB	Target
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 59 Yrs.)
Hard Edits	**SAS Label**
	TIBC, Frozen Serum (ug/dL)
English Text: TIBC, Frozen Serum (ug/dL)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
190 to 721	Range of Values	3096	3096	
.	Missing	442	3538	

LBDTIBSI	Target
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 59 Yrs.)
Hard Edits	**SAS Label**
	TIBC, Frozen Serum (umol/L)
English Text: TIBC, Frozen Serum (umol/L)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
34.01 to 129.06	Range of Values	3096	3096	
.	Missing	442	3538	

LBDPCT	Target
	B(3 Yrs. to 5 Yrs.) F(12 Yrs. to 59 Yrs.)
Hard Edits	**SAS Label**
	Transferrin saturation (%)
English Text: Transferrin saturation (%)	
English Instructions:	

Code or Value	Description	Count	Cumulative	Skip to Item
1.4 to 95	Range of Values	3096	3096	
.	Missing	442	3538	